REMARKS/ARGUMENTS

Claims 7-16 are pending in this application. By this Amendment, Applicant amends the Title of the Invention and cancels Claim 17.

Claim 17 has been canceled because these claims are directed to a non-elected invention. Applicant reserves the right to file a Divisional Application to pursue prosecution of non-elected Claim 17.

The Title of the Invention was objected to for allegedly not being descriptive. Applicant has amended the Title of the Invention as suggested by the Examiner. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this objection.

Claims 7-11 and 13-16 were rejected under 35 U.S.C. § 102(b) as being anticipated by O'Connor et al. (U.S. 5,705,117). Claims 7-11 and 13-16 were rejected under 35 U.S.C. § 102(b) as being anticipated by Shepard et al. (JP 2001-502256). Claims 7-11 and 13-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Reiff et al. (US 5,173,220). Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over either O'Connor et al., Shepherd et al., or Reiff et al., and further in view of Takeshi (JP 2001-237616). Applicant respectfully traverses the rejections of Claims 7-16.

Claim 7 recites:

> A method for manufacturing a three-dimensional photonic structure comprising a plurality of inorganic members composed of an inorganic material and a resin matrix within which the plurality of inorganic members are disposed, the resin matrix being composed of a photo-cured resin material, the method comprising the steps of:
>
> **preparing the plurality of inorganic members and a photocurable resin material**;
>
> **successively and repeatedly performing a stereolithographic step for curing stacked layers composed of the photocurable resin material along a stacking direction to form a three-dimensional component such that cavities filled with the photocurable resin material are formed at locations to be occupied by the inorganic members in the three-dimensional component having a structure in**

> **which the plurality of cured resin layers composed of the photo-cured resin material are stacked**;
>
> **inserting the inorganic members into concave portions when the concave portions are formed before closing the cavities during the stereolithographic step, each of the concave portions being at least a portion of the corresponding cavity and having an opening through which each of the inorganic members can pass, each gap between the surface of each of the concave portions and the corresponding inorganic member being filled with the photocurable resin material**; and
>
> **thermally curing the photocurable resin material remaining in the cavities**. (emphasis added)

With the unique combination and arrangement of features recited in Applicant's Claim 7, including the features of "preparing the plurality of inorganic members and a photocurable resin material," "successively and repeatedly performing a stereolithographic step for curing stacked layers composed of the photocurable resin material along a stacking direction to form a three-dimensional component such that cavities filled with the photocurable resin material are formed at locations to be occupied by the inorganic members in the three-dimensional component having a structure in which the plurality of cured resin layers composed of the photo-cured resin material are stacked," "inserting the inorganic members into concave portions when the concave portions are formed before closing the cavities during the stereolithographic step, each of the concave portions being at least a portion of the corresponding cavity and having an opening through which each of the inorganic members can pass, each gap between the surface of each of the concave portions and the corresponding inorganic member being filled with the photocurable resin material," and "thermally curing the photocurable resin material remaining in the cavities," Applicant has been able to provide a method for manufacturing a three-dimensional photonic structure in which the dielectric constants, sizes, shapes, and other aspects of the inorganic members may be adjusted as desired before being inserted into the concave portions. These dielectric constants, sizes, shapes, and other aspects are maintained in the resulting three-dimensional

photonic structure, and the spaces between the plurality of inorganic members may be set as desired. Consequently, with the three-dimensional photonic structure produced by the method recited in Applicant's Claim 7, the effect of a photonic band gap corresponding to desired wavelengths and a satisfactorily wide photonic band gap are obtained. As a result, electromagnetic waves having specific wavelengths can be shielded with high contrast. For example, highly efficient electromagnetic-wave filters and electromagnetic barriers can be manufactured. (see, for example, the first paragraph on page 5 and the second and third paragraphs on page 7 of the Substitute Specification).

The Examiner alleged that each of O'Connor et al. and Shepard et al. teaches all of the features recited in Applicant's Claim 7, and that Reiff et al. teaches all of the features recited in Applicant's Claim 7, except for the step of providing a plurality of inorganic members. The Examiner further alleged that it would have been obvious to provide a plurality of inorganic members in the process of Reiff et al. "principally in order to manufacture a desired three-dimensional structure." Applicant respectfully disagrees.

O'Connor et al. is directed to a method of combining metal and ceramic inserts into a stereolithography component. However, the method taught by O'Connor does not include any step of forming cavities into which inorganic members could be inserted or any step of thermally curing the photocurable resin material remaining in the concave portions as recited in Applicant's Claim 7. In fact, O'Connor fails to teach or suggest any step of forming cavities into which inorganic members could be inserted.

Thus, O'Connor certainly fails to teach or suggest the features of "inserting the inorganic members into concave portions when the concave portions are formed before closing the cavities during the stereolithographic step, each of the concave portions being at least a portion of the corresponding cavity and having an opening through which each of the inorganic members can pass, each gap between the surface of each of the concave portions and the corresponding inorganic member being filled with the photocurable resin material" and "thermally curing the photocurable resin material

remaining in the cavities" as recited in Applicant's Claim 7.

Shepard et al. teaches a method of forming a three-dimensional structure including the steps of selective polymerization of a batch monomer in which the three-dimensional structure includes a low permittivity material and voids; and a step of casting a high permittivity material in a liquid phase over the low permittivity material and into the voids. Shepard et al. fails to teach or suggest any step of preparing a plurality of inorganic members, any step of inserting the plurality of inorganic members into concave portions in cured resin layers, or any gaps between the surface of each of the concave portions and the corresponding inorganic member that are filled with the photocurable resin material.

Thus, contrary to the Examiner's allegations, Shepard et al. certainly fails to teach or suggest the features of "**preparing the plurality of inorganic members and a photocurable resin material**," and "**inserting the inorganic members into concave portions** when the concave portions are formed before closing the cavities during the stereolithographic step, each of the concave portions being at least a portion of the corresponding cavity and having an opening through which each of the inorganic members can pass, **each gap between the surface of each of the concave portions and the corresponding inorganic member being filled with the photocurable resin material**" (emphasis added) as recited in Applicant's Claim 7.

Reiff et al. fails to teach or suggest any step of inserting inorganic members into concave portions that are formed in the stacked layers or any step of thermally curing a photocurable resin material remaining in the concave portions as recited in claim 7. Instead, Reiff et al. merely teaches that a sacrificial substrate 32 **having no concave portions** is formed and an inorganic member 26 is disposed on the sacrificial substrate 32.

Thus, contrary to the Examiner's allegations, Reiff certainly fails to teach or suggest the features of "inserting the inorganic members into concave portions when the concave portions are formed before closing the cavities during the

stereolithographic step, each of the concave portions being at least a portion of the corresponding cavity and having an opening through which each of the inorganic members can pass, each gap between the surface of each of the concave portions and the corresponding inorganic member being filled with the photocurable resin material" and "thermally curing the photocurable resin material remaining in the cavities" as recited in Applicant's Claim 7.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of Claim 7 under 35 U.S.C. § 102(b) as being anticipated by O'Connor et al., the rejection of Claim 7 under 35 U.S.C. § 102(b) as being anticipated by Shepard et al., and the rejection of Claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Reiff et al.

The Examiner relied upon Takeshi to allegedly cure deficiencies of O'Connor, Shepard et al., and Reiff et al. However, O'Connor, Shepard et al., and Reiff et al. fail to teach or suggest the features of "preparing the plurality of inorganic members and a photocurable resin material," "successively and repeatedly performing a stereolithographic step for curing stacked layers composed of the photocurable resin material along a stacking direction to form a three-dimensional component such that cavities filled with the photocurable resin material are formed at locations to be occupied by the inorganic members in the three-dimensional component having a structure in which the plurality of cured resin layers composed of the photo-cured resin material are stacked," "inserting the inorganic members into concave portions when the concave portions are formed before closing the cavities during the stereolithographic step, each of the concave portions being at least a portion of the corresponding cavity and having an opening through which each of the inorganic members can pass, each gap between the surface of each of the concave portions and the corresponding inorganic member being filled with the photocurable resin material," and "thermally curing the photocurable resin material remaining in the cavities" as recited in Applicant's Claim 7. Thus, Applicant respectfully submits that Takeshi fails to cure the deficiencies of O'Connor, Shepard et al., and Reiff et al. described above.

Accordingly, Applicant respectfully submits that Takeshi, O'Connor, Shepard et al., and Reiff et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of features recited in Applicant's Claim 7.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claim 7 is allowable. Claims 8-16 depend upon Claim 7, and are therefore allowable for at least the reasons that Claim 7 is allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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